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THE PROBLEM OF MELODY

By L. L. THURSTONE

MELODY is variously defined according to the point of view from which it is considered. The musical theorist necessarily adopts an empirical definition of melody which makes it conform with occidental standards of consonance, whereas the student of exotic music finds himself impelled to adopt a much broader definition to cover the heterophonous phenomena of primitive music.

If we consider the structure and function of the ear according to the Helmholtz theory, we find certain analogies with the function of the other sense organs which it may not be unprofitable to follow out. The lateral displacement of the point of stimulation over the sensitive surface of a receptor yields, as its psychic correlate, the motor attribute of the sensation. The most obvious illustration of this fact is to be found in the case of the cutaneous sense departments in which a lateral shift of the stimulation point over the receptive surface gives undisputably the motor attribute of extension to the resulting sensation. Similarly we have the localizing motor attribute of visual sensations mediated by the location of the stimulation point on the retina. In the case of the olfactory sense department we do not of course discriminate as to the location of the stimulation point over the olfactory membrane, but this is due to the fact that such differentiation would not be of any significance in preserving the integrity of the organism, and hence it can not be expected to have developed.

In the case of hearing the corresponding shift of the stimulation point consists in the selective innervation of the receptive cells in the basilar membrane. The attribute resulting from this shift should, by analogy, be the motor attribute of hearing and hence pitch should be the motor attribute of auditory sensation. Just as pitch in audition corresponds to a point location in cutaneous sensations, so pitch variation corresponds to a shift of the point of stimulation over the cutaneous surface, or a similar shift over the retina of the eye. The latter has for its psychic correlate the consciousness of movement and pitch variation is also essentially a consciousness of movement. It may be objected that any qualitative alteration, whatsoever, may be conceived as in

the nature of movement, but pitch variation is intrinsically motor since its physiological antecedents are identical with those for our consciousness of overt movement in the other sense departments.

Pitch has a uni-dimensional mode of variation as contrasted with the two-dimensional mode of variation of retinal stimulation. To ask why we always consider one end of the pitch scale high and the other end low might seem to be a naive question but it must have its physiological basis. Ask any one to sing "ah" on the highest pitch of his range. The eyebrows will be raised, the neck stretched and the head elevated. The whole bodily attitude is one of climbing. Now ask him to sing the lowest tone of his compass, and the neck will be drawn down and the chin lowered. This association of high and low with pitch has its basis in the character of the instinctive behavior which favors the production of high and low pitched vocal utterance. Walk across the floor and sing any simple interval, say CE, in time with your step. You will find that your sense of fitness will be more satisfied by singing the lower tone on the down step, and the higher as the body is rising, than vice versa. There may be a physiological connection between the frequency of tones and our designation of them as high and low in the fact that greater energy and tension are required to innervate the vocal cords to produce high pitched than low pitched tones, but the causal connection between these two phenomena is mediated by the bodily attitude which coincides with the production of vocal utterance.

If visually perceived movements contain sufficient unity to render possible their perception as a unified whole the movement constitutes, to that extent, a single act. If they do not contain such unity the movements are random and are perceived, not as a single act, but as mere action. We have here a fundamental distinction between movements which constitute mere random action on the one hand and movements which can be perceived as a single act. We are not concerned with the purposive or inferential side of the question. The distinction here made is of a perceptual order. It obtains in all sense departments in which the motor attribute of localization or extension has been developed.

If we carry this analysis into the realm of audition we find that certain pitch variations can be perceived as representative of a single unified act, whereas other samples of pitch perambulation are perceived as representative of mere random action. This distinction between a single unified act, and mere random action in the motor attribute of sound sensation gives us a sufficiently flexible classificatory basis for defining melody. A certain form

of pitch excursion may be perceived by one individual as a single unified act whereas to another the same pitch excursion may seem chaotic. The former hears "a" melody, the latter none. The criterion is emphatically of a perceptual order, and hence it is markedly subject to training. Note that we are not differentiating between pleasant and unpleasant melody. That is a question generically subordinate to the differentiation between melody and mere random pitch perambulation. The former is perceived as an act, the latter as mere action. In musical theory are to be found several well defined generic bases of unity in melodic perception such as the motif, the phrase, the period, the sonata movement, etc. All of these orders of musical structure are most immediately concerned with the establishment of that unity in the perception of pitch variation which constitutes the essence of melody. Melodic unity has nothing to do with consonance and dissonance.

This broad definition of melody agrees with the great diversity of melody types. Occidental and exotic melody becomes a continuum with motor unity as a criterion of melody. The apparent break between them is due to the fact that we are trained to apply an additional criterion in our music, namely the temporal relations of consonance-dissonance. We are in fact so well trained in this regard that we are apt to confuse the motor-unity of melody with its consonance-dissonance relations.

The esthetic significance of melody is not remote in this connection. The essence of the esthetic is the conceptual anticipation of emotional behavior. The application of this definition of the esthetic is apparent enough in sculpture. It is less obviously so in the realm of pure design since the affective significance is there less immediate. In music separate consideration must be given to rhythm, melody, counterpoint, and consonance-dissonance, since these constitute separate though mutually dependent esthetic media. We are here concerned with melody. Since pitch is motor in its physiological basis, and since melody consists in the perceptual unity of the pitch excursions, it becomes evident that melody is particularly well fitted to idealize emotional behavior. I do not mean to confine myself to the voice theory of Herbert Spencer since articulatory expression is only a small part of the types of behavior by which we express our emotions.

Melody is more effective than sculpture in conceptually rendering emotional behavior since behavior is necessarily of temporal extension and melody is likewise. Sculpture, in its usual forms, is constrained to depict the particularized details

which necessarily distract the percipient in his effort to gain the conceptual emotional meaning of the esthetic object. In so far as the modernists in sculpture succeed in embodying temporal extension in form, and in so far as they break away from the distracting particularized details, toward the conceptual rendering of emotional behavior, to that extent will they greatly enhance the esthetic effectiveness of their art. Melody is fortunately deprived of any immediate association with perceptual details but it retains its physiologically derived motor significance, and hence it can only render emotional behavior in a conceptual manner. In this function it is inseparable from rhythm as an esthetic medium.

Rhythm performs a similar esthetic function in a manner more obvious than in the case of melody. The temporal discreteness of rhythm constitutes the esthetic medium whereby it renders emotionally significant behavior conceptually. This is a more direct appeal to behavioristic meaning than melody, and hence the esthetic significance of rhythm can be apprehended by intellectually less mature minds than that of melody. On the other hand the temporal relations of harmony are more recondite than those of melody and hence the apprehension of the emotionally behavioristic meaning of harmonic progression requires more training than the apprehension of the behavioristic meaning of melody. Consequently the use of harmonic progression in conceptually rendering emotional behavior is of a genetically higher order than the use of melody and the still more primitive esthetic medium of rhythm.

If melody is interpreted in the manner here suggested, as the perceptual motor-unity of pitch excursion, we not only remove many of the difficulties in the interpretation of exotic music, but we are also enabled to bring to bear a motor criterion for the esthetic in music which brings it into functional identity with the other arts as means for rendering the conceptual association of affectively significant behavior.